REMARKS

I. Status of the Claims

Claims 1, 5-9, 13-15, 19-23 and 26-27 remain in this application. Claims 1, 16, and 19 are amended in this response. Claims 2-4, 10-12, 16-18, and 24-25 have been canceled. Support for limiting the stabilizing agent in claims 1, 14 and 19 to silicate, phosphate, and/or aluminum phosphate is found in the original specification at page 15, lines 24-25.

II. Response to the Examiner's Objections

A. Specification

Examiner has objected to the Abstract. Applicants have now submitted a new Abstract that overcomes Examiner's objections as to the use of certain terms and satisfies 37 CFR 1.72.

B. Claim Objections

Applicants have deleted the phrase "to mass ratio" in claim 1 as suggested by Examiner.

III. Response to the Section 102(b) or 103(a) Rejections

Applicants traverse the rejection of claims 1, 5-9, 13-15, 19-23 and 26-27 under 35 U.S.C. § 102(b) as anticipated by, or in the alternative under 35 U.S.C. § 103(a) as obvious over Sachtler et al. (U.S. Pat. No. 5,786,294), and they respectfully ask the Examiner to reconsider and withdraw the rejection in view of the following remarks.

Applicants respectfully contend that the composition and process described in Sachtler is not the same as, or the equivalent of, the presently claimed composition and methods. Applicants' currently claimed composition now comprises nano-structured metal oxide particles and at least one stabilizing agent selected from the group consisting of silicate, phosphate, and aluminum phosphate. Sachtler does not disclose compositions containing silicate, phosphate, or aluminum phosphate stabilizing agents.

Applicants' currently claimed method to produce the composition utilizes at least one stabilizing agent selected from the group consisting of silicate, phosphate, and aluminum phosphate. Sachtler does not disclose the use of silicate, phosphate, or aluminum phosphate stabilizing agents.

Applicants' currently claimed method to produce the thermally stable nano-structured particles utilizes at least one stabilizing agent selected from the group consisting of silicate, phosphate, and aluminum phosphate. Sachtler does not disclose the use of silicate, phosphate, or aluminum phosphate stabilizing agents.

Thus, Applicants' claimed composition and methods are novel over Sachtler since Sachtler does not teach the use of silicate, phosphate, and aluminum phosphate stabilizing agents.

Applicants also respectfully contend that the presently claimed composition and methods are not obvious over Sachtler. "A proper analysis under § 103 requires, inter alia, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success." (emphasis added) *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). In this case, there is nothing in Sachtler that would motivate one of ordinary skill in the art to use silicate, phosphate, and aluminum phosphate stabilizing agents, nor would it have revealed a reasonable expectation of success in using the silicate, phosphate, and aluminum phosphate stabilizing agents.

Sachtler is directed to teaching methods for the preparation of new sulfated mesoporous zirconia materials (see Abstract). Besides sulfate ions, Sachtler also teaches that transition metal oxides can be used in place of sulfate ions, including WO_3, MoO_3 and Y_2O_3. (at Col. 10, l. 58-63). Sachtler does not disclose the use of silicate, phosphate, or aluminum phosphate stabilizing agents.

A prima facie case of obviousness has not been established since the § 103 analysis fails under both factors described above. First, there is no suggestion to one of ordinary skill in the art that they could utilize use silicate, phosphate, and aluminum

phosphate stabilizing agents to produce the thermally stable nano-structured particles or the composition of the invention. The § 103 analysis also fails the second factor. Sachtler does not reveal to those of ordinary skill a reasonable expectation that in so carrying out Applicants' claimed method one would produce nano-structured particles having extremely high thermal stability compared to particles produced using sulfate or transition metal oxide stabilizers.

A comparison of the sulfated zirconia sample from Sachtler (Example 7) and a WO_3 stabilized zirconia (Example 8 of the current application) to the currently claimed silicate, phosphate, and aluminum phosphate stabilized zirconia (Examples 1-7 of the current application) shows a much higher thermal stability of the silicate, phosphate, and aluminum phosphate stabilized compositions (see Table 1 below, summarizing the results). It is important to note that the calcinations of Sachtler were performed for only two hours, whereas the calcinations from the current application are performed for six hours thus further demonstrating the greater thermal stability of the presently claimed composition and methods. There is nothing in Sachtler that would have suggested these unexpected results.

Table 1: Comparison of Thermal Stability for Various Stabilizer Treatments

Stabilizer	**Example # (from current application)**	**Surface Area (m^2/g) (after 600 or 700°C calcination)**	
		600	**700**
Sulfate	*Example is from Sachtler*	*110*	*91*
WO_3	*8*	*91*	*74*
Silicate	1	-	97
Silicate	2	-	127
Silicate	3	-	156
Silicate	4	-	96
Aluminum Phosphate	5	136	103
Aluminum Phosphate	6	200	144
Phosphate	7	147	122

In view of the foregoing, Applicants respectfully ask the Examiner to reconsider and withdraw the rejections and pass the case to issue. Applicants invite the Examiner to telephone their attorney at (610) 359-3480 if he believes that a discussion of the application might be helpful.

Respectfully submitted,

Guoyi Fu et al.

By: Kevin M. Carroll

Kevin M. Carroll
Reg. No. 44,596
Attorney for Applicants
Lyondell Chemical Company
3801 West Chester Pike
Newtown Square, PA 19073
Phone: (610) 359-3480
June 1, 2006

CUSTOMER NUMBER 24114

VIA FACSIMILE